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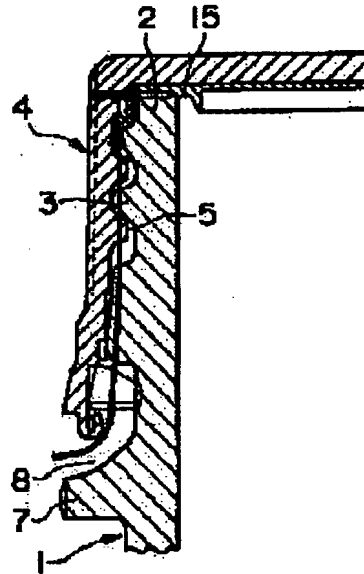
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(54) METHOD FOR WASHING INNER FACE OF CAP OF CONTAINER AFTER FILLING CONTENT LIQUID AND APPARATUS THEREFOR

(57)Abstract

PROBLEM TO BE SOLVED: To surely wash out a liquid content adhering and remaining between a container mouth and a cap in a reliable manner without executing any special machining to the cap.

SOLUTION: Vent slits extending lengthwise are provided at a plurality of places of at least either a screw thread portion 3 formed on an outer circumferential part of a container mouth 2 or a screw thread portion 5 formed on an inner face of a cap 4, which is fitted to the screw thread portion 3. After a container is filled with liquid content and tightly capped with the cap 4, pressure wash water is ejected toward a gap 8 between a neck support part 7 of the container and a lower end of the cap 4, and the wash water is diffused throughout the entire engagement area between the container mouth and the cap through the vent slits and is then allowed to flow out through the gap 8. Thus, it is so designed that the liquid content remaining between the outer circumferential part of the container mouth and the inner face of the cap is thereby washed out.



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CLAIMS

[Claim(s)]

[Claim 1] It has a vent slit in lengthwise direction two or more parts at least in one side of the screw thread section of the cap screwed in the screw thread section or this which was formed in the periphery section of the container regio oralis. After being filled up with content liquid in a container and carrying out crown-ed secure closing of said cap, pressure wash water is injected towards the gap between the neck support section of a container, and the soffit of a cap. The cap inner surface washing approach of the container after the content liquid restoration characterized by washing out the content liquid which remains between a container opening outside periphery and a cap inner surface by spreading wash water throughout the fitting side of the container regio oralis and a cap through said vent slit, and making it flow out of said gap.

[Claim 2] The cap inner surface washing approach of the container after the content liquid restoration according to claim 1 which turns said wash water to said gap from the both-sides section of the migration path of a container, and is made to be injected in the shape of a sector horizontally.

[Claim 3] The cap inner surface washing approach of the container after the content liquid restoration according to claim 2 by which the angles of spray of said wash water are made the range which is 80 degrees - 110 degrees, and are set to the water pressure of 0.5-1.0kg/cm², and 1.2-2.0l. of amount of water and min.

[Claim 4] It has a vent slit in lengthwise direction two or more parts at least in one side of the screw thread section of the cap screwed in the screw thread section or this which was formed in the periphery section of the container regio oralis. Set necessary spacing in the right-and-left both-sides section of a conveyance path which conveys the container after the content liquid restoration which was filled up

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with content liquid in the container and carried out crown-ed secure closing of said cap to degree process, and two or more wash water injection nozzles which inject pressure wash water towards the gap between the neck support section of said container and the soffit of a cap are arranged in it. By spreading said wash water throughout the fitting side of the container regio oralis and a cap through said vent slit, and making it flow out of said gap The cap inner surface washing station of the container after the content liquid restoration characterized by washing out the content liquid which remains between a container opening outside periphery and a cap inner surface.

[Claim 5] Said wash water injection nozzle is the cap inner surface washing station of the container after the content liquid restoration according to claim 4 which is made to inject wash water in the shape of a horizontal sector.

[Claim 6] The cap inner surface washing station of the container after the content liquid restoration according to claim 5 currently arranged so that the water screen of the shape of a sector which the wash water angles of spray of said wash water injection nozzle are made into 80 degrees - 110 degrees, meet said conveyance path, is prepared in 10-80 places, and is injected from each injection nozzle may carry out a lap to the water screen of the shape of a sector injected from the injection nozzle of an adjacent position into the transit route of a container at least.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] After KYAPPINKU [this invention / content liquid / fill up with and] in a container, it relates to the washing approach of the cap inner surface for eliminating the content liquid which remains between a container opening outside peripheral surface and the inner skin of a cap, and its equipment.

[0002]

[Description of the Prior Art] After carrying out quantum restoration of the content liquid, the crown-ed of the cap is carried out to a container, it is put firmly on it, and a commercial scene is supplied in the container which fills up with and sells content liquid, such as various drinks, for example, a PET bottle etc.

[0003] When carrying out a deer and filling up the above containers with content liquid, if content liquid may adhere to the opening outside peripheral surface of a container and a cap is closed securely with the condition, content liquid will dry and solidify in a negotiation phase, it may become difficult to loosen a cap or *** may be started by contact to air depending on content liquid.

[0004] Therefore, after putting the cap after content liquid restoration firmly on from the former, between the opening outside peripheral surface of a container and the inner skin of a cap is washed, and he is trying to flush the content liquid which remains.

[0005] The conventional washing approach drills many holes for washing in the peripheral wall near the top plate of a cap, and is made as [flush / the content liquid which slushes wash water from the hole for these washing, and carries out adhesion survival between the container regio oralis and a cap] (for example, JP,5-65151,A).

[0006]

[Problem(s) to be Solved by the Invention] However, there was a trouble of having

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required excessive manday [make / it is not easy on shaping to form many holes at the time of shaping, especially in the manufacturing cost of a cap increasing in order to have to drill the hole for much washing in the peripheral wall of a cap in the above-mentioned Prior art, and being the cap made of resin, therefore / it / punch using after / shaping of a cap / and laser light etc.], and leading to a cost rise further. [0007]

[Means for Solving the Problem] This invention makes it a technical problem to offer the washing approach of the cap inner surface of the container after the content liquid restoration which can eliminate certainly the content liquid which adheres between the periphery section of the container regio oralis, and the inner circumference section of a cap, and its equipment, without performing processing special to a cap.

[0008] This invention has a vent slit as a means to solve the above-mentioned technical problem in lengthwise direction two or more parts, at least in one side of the screw thread section of the cap screwed in the screw thread section or this which was formed in the periphery section of the container regio oralis. After being filled up with content liquid in a container and carrying out crown-ed secure closing of said cap, pressure wash water is injected towards the gap between the neck support section of a container, and the soffit of a cap. It is characterized by washing out the content liquid which remains between a container opening outside periphery and a cap inner surface by spreading wash water throughout the fitting side of the container regio oralis and a cap through said vent slit, and making it flow out of said gap.

[0009] Said wash water is good to make the angles of spray of said wash water into the range of 80 degrees - 110 degrees preferably, and to be referred to as the water pressure of 0.5-1.0kg/cm², and 1.2-2.0l. of amount of water and min from in [making it inject in the shape of a sector horizontally towards said gap from the both-sides section of the migration path of a container lessening the wash water which is good and is used as much as possible].

[0010] Moreover, it has a vent slit in lengthwise direction two or more parts at least in one side of the screw thread section of the cap screwed in the screw thread section or this which was formed in the periphery section of the container regio oralis as a washing station. Set necessary spacing in the right-and-left both-sides section of a conveyance path which conveys the container after the content liquid restoration which was filled up with content liquid in the container and carried out crown-ed secure closing of said cap to degree process, and two or more wash water injection nozzles which inject pressure wash water towards the gap between the neck support section of said container and the soffit of a cap are arranged in it. It is characterized

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by washing out the content liquid which remains between a container opening outside periphery and a cap inner surface by spreading said wash water throughout the fitting side of the container regio oralis and a cap through said vent slit, and making it flow out of said gap.

[0011] In this case, it is desirable that wash water is injected in the shape of a horizontal sector in the structure of said wash water injection nozzle. Furthermore, the wash water angles of spray of said wash water injection nozzle are made into 80 degrees - 110 degrees. It is desirable to arrange so that the water screen of the shape of a sector which meets said conveyance path, prepares in 10-80 places, and is injected from each injection nozzle may carry out a lap to the water screen of the shape of a sector injected from the injection nozzle of an adjacent position into the transit route of a container at least.

[0012]

[Embodiment of the Invention] Hereafter, this invention is explained with reference to the gestalt of operation shown in a drawing.

[0013] This invention shows PET bottle 1 as an example of the target container, the screw thread 3 (male screw) is formed in the periphery of the regio oralis 2 of this PET bottle 1, and drawing 1 is made as [seal / screwing secure closing of the screw thread 5 (female screw) (****8****) of the inner skin of the cap 4 by which a crown-ed is carried out to this is carried out, and].

[0014] The vent slit 6 for deflation is formed in lengthwise direction two or more parts so that the both sides or one side of the screw threads 3 and 5 may be crossed on said regio oralis 2 or cap 4. the base of the regio oralis 2 of said ped bottle 1 -- a collar -- the neck support section 7 which projects in a ** is formed, and when screwing secure closing of the screw thread 5 of cap 4 is carried out at the screw thread 3 of said regio oralis 2, a gap 8 is formed between the soffit of cap 4, and the top face of the neck support section 7.

[0015] Drawing 5 - drawing 7 are what shows the example of a concrete operation gestalt of the inner surface washing station of cap 4. The section is covered with the tunnel-like covering 10. the conveyance path 9 (conveyor) which conveys the PET bottle with which it filled up with content liquid in PET bottle 1, and crown-ed secure closing of the cap 4 was carried out at the regio oralis 2 with a straight position, and is transported to degree process -- on the way -- Two or more (10-80 one side) injection nozzles 11 and 11 which inject pressure wash water in the both-sides section of the location corresponding to said gap 8 of PET bottle 1 which has said conveyance path 9 top conveyed in this covering 10 are arranged in the conveyance

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direction.

[0016] This injection nozzle 11 is set in the location estranged about 25mm from the core of PET bottle 1 conveyed, as shown in drawing 3 and drawing 4. Inject wash water horizontally and the angles of spray alpha in ***** 80 degrees - 110 degrees. It is made as [inject / preferably / the water screen 12 of the shape of a sector of 90 degrees of abbreviation / form and], and [in a transit route], it is arranged so that the water screens 12 and 12 by the injection nozzle of an adjacent position of PET bottles 1 and 1 and -- and -- may carry out a lap mutually.

[0017] Pressure water (water pressure of 0.5-1.0kg/cm² and per minute 1.2-2.0l.) is supplied to said each injection nozzles 11 and 11 through the branch pipes 14 and 14 which start from feed pipes 13 and 13.

[0018] In addition, in drawing 8, a sign 15 is packing prepared in the top-plate underside of cap 4, it sticks to the upper bed of the regio oralis 2 of PET bottle 1, and the inside of a bottle is sealed. Next, the detergency of a cap inner surface is explained.

[0019] PET bottle 1 with which it filled up with content liquid and crown-ed secure closing of the cap 4 was carried out is conveyed in the state of 1 train in the conveyance path 9, and advances into covering 10. Pressure water is injected from the injection nozzles 11 and 11 on either side towards the gap 8 between the soffit of the cap 4 of PET bottle 1, and the neck support section 7 in covering 10.

[0020] The wash water containing from the above-mentioned gap 8 results to the upper part of the top screw thread 3 through the vent slit 6, as shown in drawing 8 and drawing 9, it transmits and flows between the outside surface of the regio oralis 2 of PET bottle 1, and the inner surfaces of cap 4 in screw threads 3 and 5, returns to said gap 8 again, and is discharged outside.

[0021] It is carried out in the section until such detergency finishes passing through the installation region of an injection nozzle 11, and all the content liquid that carries out adhesion survival between the regio oralis 2 and cap 4 between them is washed out.

[0022] In addition, it is applicable even if it is the container of not only a PET bottle but other construction material as a target container.

[0023]

[Effect of the Invention] It can prevent certainly being shipped while washing of the cap inner surface after crown-ed secure closing was completed in the container regio oralis, without preparing the hole for washing in a cap according to this invention as explained above, and content liquid had carried out the adhesion residual at the cap

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inner surface.

[0024] Moreover, since what is necessary is just to inject wash water horizontally from the both sides of the conveyance path of a container, the structure of a washing station becomes very easy and can also lessen futility of wash water.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The front view in which this invention shows the PET bottle as an example of the target container.

[Drawing 2] The half-section amplification perspective view of the **** regio oralis.

[Drawing 3] The explanatory view of plane view showing the arrangement relation of an injection nozzle, and the injection relation of wash water.

[Drawing 4] **** side elevation.

[Drawing 5] The side elevation showing the example of a washing station.

[Drawing 6] **** top view.

[Drawing 7] The A-A expanded sectional view of drawing 5.

[Drawing 8] The fragmentary sectional view showing the flow of the wash water at the time of washing.

[Drawing 9] The partial perspective view showing the flow of the wash water by the side of the **** container regio oralis.

[Description of Notations]

- 1 PET Bottle (Container)
- 2 Regio Oralis
- 3 Five Screw thread
- 4 Cap
- 6 Vent Slit
- 7 Neck Support Section
- 8 Gap
- 9 Conveyance Path
- 10 Covering
- 11 Injection Nozzle

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12 Water Screen

13 Feed Pipe

14 Branch Pipe

15 Packing

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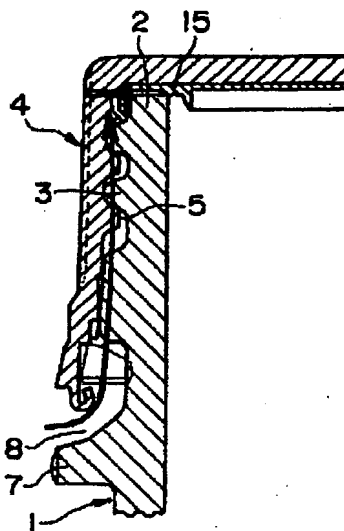
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(54) 【発明の名称】 内容液充填後の容器のキャップ内面洗浄方法およびその装置

(57) 【要約】

【課題】 キャップに特別な加工を施すことなく容器口部とキャップとの間に付着残存する内容液を確実に洗浄することを可能とする。

【解決手段】 容器口部2の外周部に形成されたネジ山部3またはこれに螺合するキャップ4のネジ山部5の少なくとも一方に縦方向複数箇所にベントスリット6を有し、容器内に内容液を充填して前記キャップを被冠締着したのち容器のネックサポート部7とキャップ4の下端との間の間隙8に向け圧力洗浄水を噴射し、前記ベントスリット6を通じて洗浄水を容器口部とキャップとの嵌合面全域に行きわたらせて前記間隙8から流出させることにより容器口部外周部とキャップ内面との間に残存する内容液を洗い落すようにしたことにある。



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【特許請求の範囲】

【請求項1】 容器口部の外周部に形成されたネジ山部またはこれに螺合するキャップのネジ山部の少なくとも一方に縦方向複数箇所にベントスリットを有し、容器内に内容液を充填して前記キャップを被冠締着したのち容器のネックサポート部とキャップの下端との間の間隙に向け圧力洗浄水を噴射し、前記ベントスリットを通じて洗浄水を容器口部とキャップとの嵌合面全域に行きわたらせて前記間隙から流出させることにより容器口部外周部とキャップ内面との間に残存する内容液を洗い落すことを特徴とする内容液充填後の容器のキャップ内面洗浄方法。

【請求項2】 前記洗浄水を容器の移送経路の両側部から前記間隙に向けて水平方向に扇形状に噴射するようにされている請求項1記載の内容液充填後の容器のキャップ内面洗浄方法。

【請求項3】 前記洗浄水の噴射角が $80^{\circ} \sim 110^{\circ}$ の範囲とされ、水圧 $0.5 \sim 1.0 \text{ kg/cm}^2$ 、水量 $1.2 \sim 2.0 \text{ リットル/min}$ とされている請求項2記載の内容液充填後の容器のキャップ内面洗浄方法。

【請求項4】 容器口部の外周部に形成されたネジ山部またはこれに螺合するキャップのネジ山部の少なくとも一方に縦方向複数箇所にベントスリットを有し、容器内に内容液を充填して前記キャップを被冠締着した内容液充填後の容器を次工程へ搬送する搬送経路の左右両側部に前記容器のネックサポート部とキャップの下端との間の間隙に向けて圧力洗浄水を噴射する洗浄水噴射ノズルを所要の間隔を置いて複数個配設し、前記洗浄水を前記ベントスリットを通じ容器口部とキャップとの嵌合面全域に行きわたらせて前記間隙から流出させることにより容器口部外周部とキャップ内面との間に残存する内容液を洗い落すようにしたことを特徴とする内容液充填後の容器のキャップ内面洗浄装置。

【請求項5】 前記洗浄水噴射ノズルは、洗浄水を水平方向扇形状に噴射するようにされている請求項4記載の内容液充填後の容器のキャップ内面洗浄装置。

【請求項6】 前記洗浄水噴射ノズルの洗浄水噴射角が $80^{\circ} \sim 110^{\circ}$ とされ、前記搬送経路にそって $10 \sim 80$ 箇所に設けられ、各噴射ノズルから噴射される扇形状の水膜が隣位の噴射ノズルから噴射される扇形状の水膜と少なくとも容器の通過経路内においてラップするように配設されている請求項5記載の内容液充填後の容器のキャップ内面洗浄装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、容器内に内容液を充填してキャッピングしたのち、容器口部外周面とキャップの内周面との間に残存する内容液を排除するためのキャップ内面の洗浄方法およびその装置に関する。

【0002】

【従来の技術】 各種飲料等の内容液を充填して販売する容器、例えばペットボトルなどにおいては、容器に内容液を定量充填したのちキャップを被冠して締着し、市場に供給される。

【0003】 しかして上記のような容器に内容液を充填するとき、容器の口部外周面に内容液が付着することがあり、その状態でキャップを締着すると流通段階で内容液が乾燥して固化し、キャップをゆるめることが難しくなったり、あるいは内容液によっては空気との接触により腐蝕を起こす場合がある。

【0004】 そのため従来から内容液充填後キャップを締着したあとで容器の口部外周面とキャップの内周面との間を洗浄して、残存する内容液を洗い流すようにしている。

【0005】 従来の洗浄方法は、キャップの天板近くの周壁に多数の洗浄用孔を穿設しておき、これら洗浄用孔から洗浄水を流し込んで容器口部とキャップとの間に付着残存する内容液を洗い流すようになされている（例えば特開平5-65151号公報）。

【0006】

【発明が解決しようとする課題】 しかるに上記従来の技術では、キャップの周壁に多数の洗浄用孔を穿設しなければならぬためキャップの製造コストが高まり、樹脂製キャップの場合には特に成形時に多数の孔を形成することは成形上容易でなく、したがってキャップの成形後、レーザー光を用いて穿孔させるなど余分な工数を要し、一層コストアップに繋がるという問題点があった。

【0007】

【課題を解決するための手段】 本発明は、キャップに特別な加工を施すことなく容器口部の外周部とキャップの内周部との間に付着する内容液を確実に排除することができる内容液充填後の容器のキャップ内面の洗浄方法およびその装置を提供することを課題とするものである。

【0008】 上記課題を解決する手段として本発明は、容器口部の外周部に形成されたネジ山部またはこれに螺合するキャップのネジ山部の少なくとも一方に縦方向複数箇所にベントスリットを有し、容器内に内容液を充填して前記キャップを被冠締着したのち容器のネックサポート部とキャップの下端との間の間隙に向け圧力洗浄水を噴射し、前記ベントスリットを通じて洗浄水を容器口部とキャップとの嵌合面全域に行きわたらせて前記間隙から流出させることにより容器口部外周部とキャップ内面との間に残存する内容液を洗い落すことを特徴とする。

【0009】 前記洗浄水は容器の移送経路の両側部から前記間隙に向けて水平方向に扇形状に噴射するようにするのがよく、また使用する洗浄水を極力少なくするうえから、好ましくは前記洗浄水の噴射角を $80^{\circ} \sim 110^{\circ}$ の範囲とし、水圧 $0.5 \sim 1.0 \text{ kg/cm}^2$ 、水量 $1.2 \sim 2.0 \text{ リットル/min}$ とするのがよい。

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【0010】また洗浄装置として、容器口部の外周部に形成されたネジ山部またはこれに螺合するキャップのネジ山部の少なくとも一方に縦方向複数箇所にベントスリットを有し、容器内に内容液を充填して前記キャップを被冠締着した内容液充填後の容器を次工程へ搬送する搬送経路の左右両側部に前記容器のネックサポート部とキャップの下端との間の間隙に向けて圧力洗浄水を噴射する洗浄水噴射ノズルを所要の間隔において複数個配設し、前記洗浄水を前記ベントスリットを通じ容器口部とキャップとの接合面全域に行きわたらせて前記間隙から流出させることにより容器口部外周部とキャップ内面との間に残存する内容液を洗い落すようにしたことを特徴とする。

【0011】この場合、前記洗浄水噴射ノズルの構造を、洗浄水が水平方向扇形状に噴射されるようにすることが好ましく、さらに前記洗浄水噴射ノズルの洗浄水噴射角を $80^{\circ} \sim 110^{\circ}$ とし、前記搬送経路にそって10～80箇所へ設け、各噴射ノズルから噴射される扇形状の水膜が隣位の噴射ノズルから噴射される扇形状の水膜と少なくとも容器の通過経路内においてラップするように配設することが好ましい。

【0012】

【発明の実施の形態】以下、本発明を図面に示す実施の形態を参照して説明する。

【0013】図1は本発明が対象とする容器の一例としてペットボトル1を示すもので、このペットボトル1の口部2の外周にはネジ山3（雄ネジ）が形成されており、これに被冠されるキャップ4の内周面のネジ山5（雌ネジ）（図8示）が螺合締着されて密封するようになされている。

【0014】前記口部2またはキャップ4には、そのネジ山3、5の双方または一方を横断するようにガス抜き用のベントスリット6が縦方向複数箇所に形成されている。前記ペットボトル1の口部2の基部には鐮状に突出するネックサポート部7が形成されており、前記口部2のネジ山3にキャップ4のネジ山5を螺合締着したときキャップ4の下端とネックサポート部7の上面との間に間隙8が形成されるようになっている。

【0015】図5～図7はキャップ4の内面洗浄装置の具体的実施形態例を示すもので、ペットボトル1内に内容液が充填されその口部2にキャップ4が被冠締着されたペットボトルを直立姿勢で搬送して次工程へ移送する搬送経路9（コンベア）の途中部がトンネル状のカバー10で覆われ、このカバー10内において前記搬送経路9上を搬送されるペットボトル1の前記間隙8に対応する位置の両側部に圧力洗浄水を噴射する噴射ノズル11、11が搬送方向に複数個（片側10～80個）配設されている。

【0016】この噴射ノズル11は、図3、図4に示すように、搬送されるペットボトル1の中心から約25m

m離れた位置におかれ、洗浄水を水平方向に噴射し、かつ半面視における噴射角 α が $80^{\circ} \sim 110^{\circ}$ 、好ましくは略 90° の扇形状の水膜12を形成して噴射するようになされており、ペットボトル1、1、…の通過経路内において隣位の噴射ノズルによる水膜12、12、…が互いにラップするように配設されている。

【0017】前記各噴射ノズル11、11へは、給水管13、13から立ち上がる枝管14、14を通じて圧力水（水圧0.5～1.0kg/cm²、毎分1.2～2.0リットル）が供給される。

【0018】なお図8において符号15は、キャップ4の天板下面に設けられたパッキンで、ペットボトル1の口部2の上端に密着してボトル内が密封されるものである。次にキャップ内面の洗浄作用について説明する。

【0019】内容液が充填されキャップ4が被冠締着されたペットボトル1は搬送経路9を1列状態で搬送され、カバー10内に進入する。カバー10内においては、ペットボトル1のキャップ4の下端とネックサポート部7との間の間隙8に向けて左右の噴射ノズル11、11から圧力水が噴射される。

【0020】上記間隙8から入った洗浄水は、図8および図9に示すようにベントスリット6を通過して最上位のネジ山3の上部まで至り、ペットボトル1の口部2の外周とキャップ4の内面との間をネジ山3、5を伝わって流れ、再び前記間隙8へ戻って外部に排出される。

【0021】このような洗浄作用が噴射ノズル11の設置域を通過し終るまでの区間において行なわれ、その間に口部2とキャップ4との間に付着残存する内容液はすべて洗い落される。

【0022】なお対象とする容器としてはペットボトルに限らず、他の材質の容器であっても適用することができる。

【0023】

【発明の効果】以上説明したように本発明によれば、キャップに洗浄用の孔を設けることなく容器口部に被冠締着後のキャップ内面の洗浄ができ、キャップ内面に内容液が付着残留したまま出荷されることを確実に防止することができる。

【0024】また洗浄水は容器の搬送経路の両側から水平方向に噴射すればよいので、洗浄装置の構造が頗る簡単になり、洗浄水の無駄も少なくすることができる。

【図面の簡単な説明】

【図1】本発明が対象とする容器の一例としてのペットボトルを示す正面図。

【図2】同、口部の半部拡大斜視図。

【図3】噴射ノズルの配置関係および洗浄水の噴射関係を示す平面視の説明図。

【図4】同、側面図。

【図5】洗浄装置の具体例を示す側面図。

【図6】同、平面図。

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【図7】図5のA-A拡大断面図。

【図8】洗浄時の洗浄水の流れを示す部分断面図。

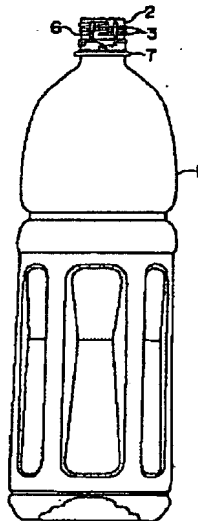
【図9】同、容器口部側の洗浄水の流れを示す部分斜視図。

【符号の説明】

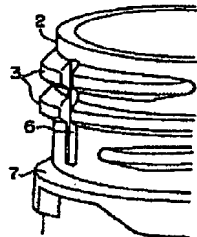
- 1 ペットボトル（容器）
 2 口部
 3、5 ネジ山
 4 キャップ
 6 ペントスリット

- 7 ネックサポート部
 8 間隙
 9 搬送経路
 10 カバー
 11 噴射ノズル
 12 水膜
 13 給水管
 14 枝管
 15 パッキン

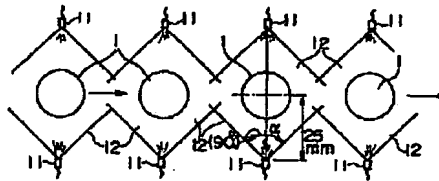
【図1】



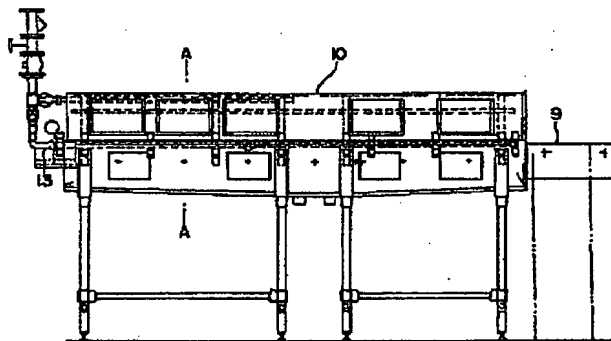
【図2】



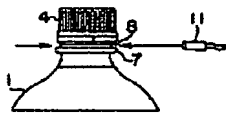
【図3】



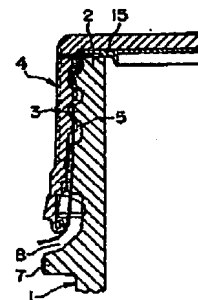
【図5】



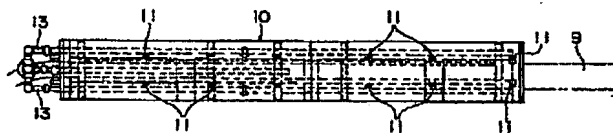
【図4】



【図8】



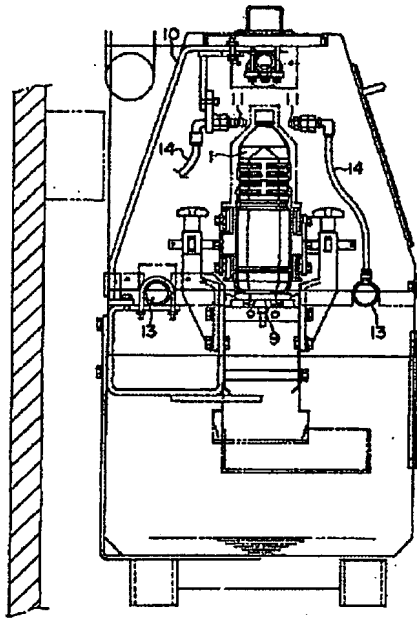
【図6】



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【図7】



【図9】

